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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/916,436	07/30/2001	Todd D. Newman	36.P288	1490

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EXAMINER
HAVAN, THU THAO

ART UNIT	PAPER NUMBER
2672	

DATE MAILED: 07/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/916,436	NEWMAN, TODD D.	
	Examiner	Art Unit	
	Thu-Thao Havan	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 July 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. This application has been filed with informal drawings which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

Specification

2. The disclosure is objected to because of the following informalities: In page 2, lines 18-19 of the background of the invention, "figure 19" is not in the drawing. Furthermore, figures 6a-6b and 14a-14b are illustrated in the drawing but not discussed in the specification.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims **1-29** are rejected under 35 U.S.C. 103(a) as being unpatentable over MacDonald et al. (US patent no. 5,463,480) in view of Barry et al. (US patent no. 4,839,722).

Re claim **1**, MacDonald teaches a method for converting a color value of a color in a perceptual color space (col. 2, lines 3-32), comprising the steps of applying multiple

inverse transforms to the color value, each transform for transforming the color value from a perceptual color space to a viewing condition dependent color space, each different inverse transform corresponding to a different viewing condition, thereby resulting in plural different target color values for the color in respective ones of multiple different viewing conditions in a viewing condition dependent space (col. 2, line 3 to col. 3, line 60; col. 6, lines 27-59). In other words, MacDonald teaches the conversion to perceptual colour space automatically takes account of true colour appearance which is normally affected by viewing conditions such as the level and spectral distribution of the light source, also ambient illumination, surround, presentation medium and the like while the image represented in perceptual colour space will more nearly match the attributes of human perception mechanism and thus be much easier to assess and modify. He also allows not only the appearance of an image when reproduced on a different device to be simulated but also predicts the change in appearance of a coloured image under various viewing conditions. In addition, he discloses a comprehensive model of colour appearance that takes into account the surrounding and viewing conditions as well as the colour stimulus values of each coloured area in the image. Factors that are known to affect appearance are the luminance level and spectral power distribution of the light source(s), viewing geometry (i.e. relative angles and distance of illuminant, object and observer), surface texture and gloss, type of medium (i.e. luminous or non-luminous), and the sensitivity of the observer's visual system. Further factors within a scene can affect appearance, such as edge quality, size and shape of the area being considered, and the lightness and colour of adjacent areas and the further surround.

MacDonald fails to specifically disclose calculating a single color value in device dependent color space that fits the plural target color values with acceptable error as claimed. However, Barry teaches calculating a single color value in device dependent color space that fits the plural target color values with acceptable error (col. 14, line 37 to col. 15, line 50; fig. 7). He teaches an error signal for each color is derived and an appropriate adjustment is made to the corresponding complimentary pigment value then existing in the table. The calculation of the actual spectral content of the image which would result from using these pigment density values is then made. The process of comparing the resultant spectral output of the image actually created by using these particular pigments densities to the input spectral content in RGB space is repeated until the error signal reaches the minimal resolution of the digital representation of the color values, or until the process has been repeated a predetermined number of times, twenty-five (25) in the preferred embodiment. Thus, it would have been obvious for one of ordinary skill in the art to combine calculating a single color value in device dependent color space that fits the plural target color values with acceptable error of Barry to the system of MacDonald because it would have enabled an acceptable error level has been reached (or a predetermined number of iterations has occurred) and the new adjusted values for the output pigment triplet are provided on bus to look up table for storage and subsequent use during printing (Barry: col. 14, line 37 to col. 15, line 50; fig. 7).

Re claims **7-8, 17-18, 21-22, and 29**, MacDonald teaches multiple different viewing conditions comprises different viewing illuminants and multiple different

surrounds (fig. 1). In other words, MacDonald teaches the appearance of an image when reproduced on a different device to be simulated but also predicts the change in appearance of a coloured image under various viewing conditions.

Re claim **9**, MacDonald teaches gamut-mapping in the perceptual color space (fig. 5). FIG. 5 of MacDonald shows an example of a gamut mapping procedure. Lightness (L) is plotted against colourfulness (C) for a given hue angle. The display device gamut is first scaled in both L and C by a factor of L2/L1 in order to set the reference white levels to the same value. The point P represents a colour on the boundary of the scaled display gamut, still outside the printing device gamut. Three possible strategies for truncating the colour to the common gamut subset are indicated: limit C at the same level of L (P1); limit both L and C along a line toward the 50% neutral grey point Lg (P2); or limit L at the same level of C (P3). Normally the first of these strategies would be preferred because it preserves lightness, which most affects the appearance of the image.

Re claims **10, 26, and 28**, Barry teaches storing the device dependent values in a look-up table accessible as a function of the color values in perceptual color space (col. 7, lines 1-35). In other words, Barry teaches color/pigment values are used to create a look up table which directly translates an input triplet in the form (red color value, green color value, blue color value) into an output pigment triplet in the form (cyan density value, magenta density value, yellow density value).

Re claims **11-12**, MacDonald teaches estimating likely XYZ values for a given color patch based on probabilistic estimates of the most likely viewing conditions,

measurements of the spectral reflectance of colorants on a given medium and the response functions of the CIE Standard Observer so as to perform gamut mapping (col. 1, line 47 to col. 2, line 8).

Re claims **13-15**, MacDonald teaches a program memory for storing process steps executable to perform a method (col. 4, lines 13-64; fig. 2). MacDonald discloses the storage device for storing color information.

Re claims **16, 19, and 27**, the limitations of claims 16, 19, and 27 are identical to claim 1 above. Therefore, claims 15, 19, and 27 are treated the same as discussed with respect to claim 1 above.

Claims **2-6, 20, and 23-25** are rejected under 35 U.S.C. 103(a) as being unpatentable over MacDonald et al. (US patent no. 5,463,480) in view of Barry et al. (US patent no. 4,839,722) and further in view of Snyder et al. (US patent no. 5,907,495).

Re claims **2-6, 20, and 23-25**, MacDonald and Barry fail to teach calculating a color value in device dependent color space comprises the step of applying regression analysis to the plural different target color values using a spectral model that measures spectral reflectance of colors in the device dependent color space. However, Snyder teaches calculating a color value in device dependent color space comprises the step of applying regression analysis to the plural different target color values using a spectral model that measures spectral reflectance of colors in the device dependent color space (col. 10, line 19 to col. 12, line 13; fig. 5). He teaches linear regression analysis is

performed using the multi-angle L*a*b* measurements and the pigment apportionments to derive regression constants (K) and factor coefficients (ki), where i designates the associated factor (pigment). In the present example, the color coordinates L*a*b* are designated as the regression dependent variables, and the constituents (pigments) C.sub.l -C.sub.n are designated as the regression independent variables or factors. The regression apportions shares in each of the L*a*b* coordinates to each of the n factors (constituents) C.sub.l -C.sub.n based on the x paint samples S.sub.l -S.sub.x thereby providing a respective set of factor (pigment) coefficients and constant for each L*a*b* coordinate.

Thus, it would have been obvious for one of ordinary skill in the art to combine calculating a color value in device dependent color space comprises the step of applying regression analysis to the plural different target color values using a spectral model that measures spectral reflectance of colors in the device dependent color space of Snyder to the system of MacDonald and Barry because it would have enabled the apportionments of the constituents and the color coordinates for all of the test panels are correlated such as through regression analysis and a relational model characterized by correlation of the constituents to color coordinates results (Snyder: col. 10, line 19 to col. 12, line 13; fig. 5)

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Narahara, US Patent No. 6,023,527

Inquiries

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thu-Thao Havan whose telephone number is (703) 308-7062. The examiner can normally be reached on Monday to Thursday from 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on (703) 305-4713.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Thu-Thao Havan
Art Unit: 2672
July 27, 2003

MICHAEL RAZAVI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600